

Amendments to the Claims

This listing of claims replaces all prior versions and listings of claims in the application.

Listing of Claims

1. (Original) Functionalized polymer of formula I



wherein the symbols have the following meanings

"polymer" soluble linear or branched homopolymers or random copolymers and derivatives thereof selected from the group consisting of alkylene glycol homopolymers, alkylene glycol copolymers, polyvinyl alcohol, polyvinyl pyrrolidone, poly-1,3-dioxolane, poly-1,3,6-trioxane, ethylene/maleic anhydride copolymer, polyaminoacids and polysaccharides;

R^1, R^2, R^3, R^4, R^5 hydrogen, alkyl, aryl;

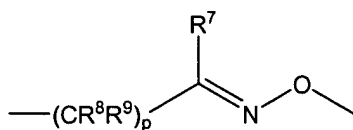
m 2 to 4, wherein the residues R^1 and R^2 may be the same or different in the m groups CR^1R^2 ;

n 0 to 20 ;

o 0 to 20, wherein in the case of $n = 0$, o is not 0, wherein the residues R^3 and R^4 may be the same or different in the o groups CR^3R^4 ;

r 0 or 1;

X $-(CR^8R^9)_pO-$, $-(CR^8R^9)_pS-$, $-(CR^8R^9)_pNR^6-$, $-(CR^8R^9)_pOC(O)-$, $-(CR^8R^9)_pC(O)O-$, $-(CR^8R^9)_pC(G)N(R^{10})O-$, $-(CR^8R^9)_pN(R^{11})O-$,



wherein one or more groups $-(CR^8R^9)-$ may be replaced by W, whereby a chemically reasonable group is formed;

W ONR^{12} , $C(G)$;

G S, O, NR^{14} ;

$R^6, R^7, R^8, R^9, R^{10}, R^{11}, R^{12}, R^{14}$ hydrogen, alkyl, aryl;

wherein the group $-(X)_r-[(CR^1R^2)_mO]_n[CR^3R^4]_o-ONHR^5$ is covalently linked with at least one terminal group or at least one centrally located groups of the "polymer."

$$\text{---}(\text{CR}^8\text{R}^9)_p\text{C}(\text{R}^7)=\text{N}-\text{O}-, -(\text{CR}^8\text{R}^9)_p\text{N}(\text{R}^{11})\text{O}- \text{ or } (\text{CR}^8\text{R}^9)_p\text{C}(\text{G})\text{N}(\text{R}^{10})\text{O}-.$$

4. (Currently Amended) Functionalized polymer as claimed in ~~any of claims 1 or 3~~ claim 1, wherein the group $-\left[(\text{CR}^1\text{R}^2)_m\text{O}\right]_n\left[\text{CR}^3\text{R}^4\right]_o-$ is $-\text{CH}_2\text{CH}_2\text{OCH}_2\text{CH}_2-$.

$$\text{"polymer"}-(\text{X})_r-[(\text{CR}^1\text{R}^2)_m\text{O}]_n[\text{CR}^3\text{R}^4]_o-\text{O}-\text{N}=\text{C}(\text{R}^{13})-\text{"protein"} \quad (\text{II})$$

"polymer" soluble linear or branched homopolymers or random copolymers and derivatives thereof selected from the group consisting of alkylene glycol homopolymers, alkylene glycol copolymers, polyvinyl alcohol, polyvinyl pyrrolidone, poly-1,3-dioxolane, poly-1,3,6-trioxane, ethylene/maleic anhydride copolymer, polyaminoacids and polysaccharides;

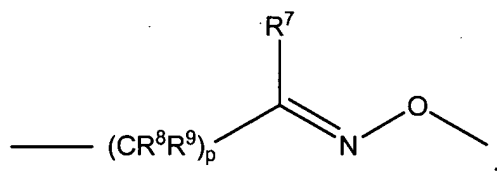
m 2 to 4, wherein the residues R¹ and R² may be the same or different in the
m groups CR¹R²;

n 0 to 20;

o 0 to 20, wherein in the case of $n = 0$, o is not 0, wherein the residues R^3 and R^4 may be the same or different in the o groups CR^3R^4 ;

r 0 or 1;

X $-(CR^8R^9)_pO-$, $-(CR^8R^9)_pS-$, $-(CR^8R^9)_pNR^6-$, $-(CR^8R^9)_pOC(O)-$, $-(CR^8R^9)_pC(O)O-$, $-(CR^8R^9)_pC(G)N(R^{10})O-$, $-(CR^8R^9)_pN(R^{11})O-$,



wherein one or more groups $-(CR^8R^9)-$ may be replaced by W, whereby a chemically reasonable group is formed;

W O, NR^{12} , C (G);

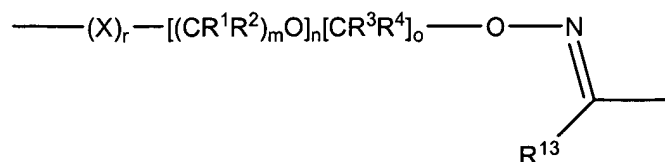
G S, O, NR^{14} ;

$R^6, R^7, R^8, R^9, R^{10}, R^{11}, R^{12}, R^{14}$ hydrogen, alkyl, aryl, ~~preferably hydrogen~~;

p 0 to 20, wherein the residues R^8 and R^9 may be the same or different in the p groups CR^8R^9 ;

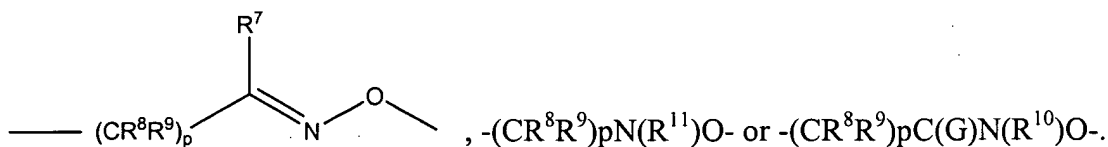
R^{13} hydrogen, alkyl, aryl;

"protein" amino acid sequence prepared by reaction of at least 2 amino acids wherein the group

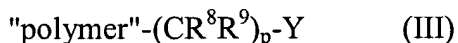


is covalently linked with at least one terminal group or at least one centrally located group of the "polymer" and the "protein".

6. (Original) Conjugate as claimed in claim 5, wherein X is



7. (Currently Amended) Conjugate as claimed in claim 5 ~~or 6~~, wherein the polymer is hydroxyalkyl starch, dextran or ethylene glycol homopolymer.
8. (Currently Amended) Conjugate as claimed in ~~any of claims 5 to 7~~ claim 5, wherein the "protein" is selected from the group consisting of EPO, G-CSF, Factor VII, Factor IX, IFN beta, AT III, A1AT, Factor VIII and APC.
9. (Currently Amended) Conjugate as claimed in ~~any of claims 5 or 8~~ claim 5, wherein the group $-(\text{CR}^1\text{R}^2)_m\text{O}]_n[\text{CR}^3\text{R}^4]_o-$ is $-\text{CH}_2\text{CH}_2\text{OCH}_2\text{CH}_2-$.
10. (Original) Process for preparing a functionalized polymer comprising the step of reacting a polymer of formula III



with a compound of formula IV



wherein the symbols have the following meanings

"polymer" soluble linear or branched homopolymers or random copolymers and derivatives thereof selected from the group consisting of alkylene glycol homopolymers, alkylene glycol copolymers, polyvinyl alcohol, polyvinyl pyrrolidone, poly-1,3-dioxolane, poly-1,3,6-trioxane, ethylene/maleic anhydride copolymer, polyaminoacids and polysaccharides;

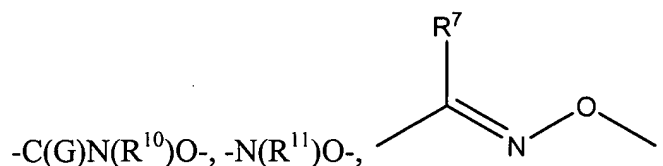
$\text{R}^1, \text{R}^2, \text{R}^3, \text{R}^4, \text{R}^5$ hydrogen, alkyl, aryl;

m 2 to 4, wherein the residues R^1 and R^2 may be the same or different in the m groups CR^1R^2 ;

n 0 to 20 ;

o 0 to 20, wherein in the case of $n = 0$, o is not 0, wherein the residues R^3 and R^4 may be the same or different in the o groups CR^3R^4 ;

Y and Q functional groups, which are suitable to react together to give one of the following linking groups $-\text{O}-$, $-\text{S}-$, $-\text{NR}^6-$, $-\text{OC}(\text{O})-$, $-\text{C}(\text{O})\text{O}-$,



wherein one or more groups $-(CR^8R^9)-$ may be replaced by W, whereby a chemically reasonable group is formed;

W O, NR^{12} , C(G);

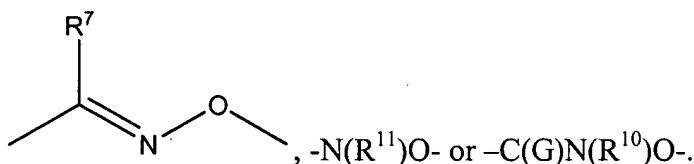
G S, O, NR^{14} ;

$R^6, R^7, R^8, R^9, R^{10}, R^{11}, R^{12}, R^{14}$ hydrogen, alkyl, aryl;

p 0 to 20, wherein the residues R^8 and R^9 may be the same or different in the p groups CR^8R^9 ;

wherein the group $-(CR^8R^9)_p-Y$ is covalently linked with terminal groups or centrally located groups of the "polymer".

11. (Original) Process as claimed in claim 10, wherein Y and Q are functional groups, which are suitable to react together to give the following linking group



12. (Currently Amended) Process as claimed in claim 10 ~~or 11~~, wherein the polymer is hydroxyalkyl starch, dextran or ethylene glycol homopolymer.
13. (Currently Amended) Process as claimed in ~~any of claims 10 to 12~~ claim 10, wherein the group $-[(CR^1R^2)_mO]_n[CR^3R^4]_o-$ is $-CH_2CH_2OCH_2CH_2-$.
14. (Canceled)
15. (Currently Amended) Process for preparing a conjugate, comprising the step of reacting a functionalized polymer as claimed in ~~any of claims 1 to 4 or 14~~ claim 1 with a functionalized protein of formula V

"protein" - Z (V)

wherein Z is a group comprising a carbonyl group or a group which is suitable of forming a carbonyl group or another group which is reactable with the functionalized polymer, wherein Z is covalently linked with least one terminal group or least one centrally located group of the "protein".

16. (Currently Amended) Process as claimed in claim 15, wherein a functionalized polymer as claimed in ~~any of claims 2 to 4~~ claim 2 is employed.

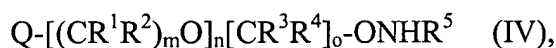
17. (Currently Amended) Process as claimed in claim 15 ~~or 16~~, wherein the "protein" is selected from the group consisting of EPO, G-CSF, Factor VII, Factor IX, IFN beta, AT III, A1AT, Factor VIII and APC.

18. (Original) Process for preparing a conjugate, comprising the steps

a) reacting a polymer of formula III



with a compound of formula IV



wherein the symbols have the following meanings

"polymer" soluble linear or branched homopolymers or random copolymers and derivatives thereof selected from the group consisting of alkylene glycol homopolymers, alkylene glycol copolymers, polyvinyl alcohol, polyvinyl pyrrolidone, poly-1,3-dioxolane, poly-1,3,6-trioxane, ethylene/maleic anhydride copolymer, polyaminoacids and polysaccharides;

$\text{R}^1, \text{R}^2, \text{R}^3, \text{R}^4, \text{R}^5$ hydrogen, alkyl, aryl;

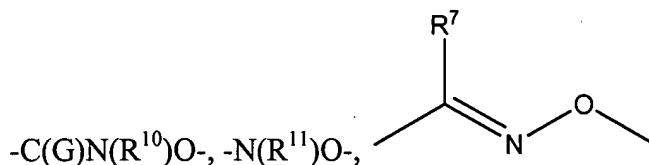
m 2 to 4, wherein the residues R^1 and R^2 may be the same or different in the m groups CR^1R^2 ;

n 0 to 20 ;

o 0 to 20, wherein in the case of $n = 0$, o is not 0, wherein the residues R^3 and R^4 may be the same or different in the o groups CR^3R^4 ;

Y and Q functional groups, which are suitable to react together to give one of the

following linking groups -O-, -S-, -NR⁶-, -OC(O)-, -C(O)O-,



wherein one or more groups- (CR⁸R⁹)- may be replaced by W, whereby a chemically reasonable group is formed;

W O, NR¹², C(G);

G S, O, NR¹⁴;

R⁶, R⁷, R⁸, R⁹, R¹⁰, R¹¹, R¹², R¹⁴ hydrogen, alkyl, aryl;

p 0 to 20, wherein the residues R⁸ and R⁹ may be the same or different in the p groups CR⁸R⁹; wherein the group -(CR⁸R⁹)_p-Y is covalently linked with least one terminal group and/or least one centrally located group of the "polymer", wherein a functionalized polymer is obtained, and

b) reacting the functionalized polymer obtained in step a) with a functionalized protein of formula V

"protein"-Z (V)

wherein Z is a group comprising a carbonyl group or a group which is suitable of forming a carbonyl group or another group which is reactable with the functionalized polymer, wherein Z is covalently linked with least one terminal group and/or least one centrally located group of the "protein".

19-20. (Canceled)

21. (Currently Amended) A pharmaceutical composition comprising in a therapeutically effective amount a conjugate as claimed in ~~any of claims 5 to 9 or 19~~ claim 5.

22. (Original) The pharmaceutical composition as claimed in claim 21, further comprising at least one pharmaceutically acceptable diluent, adjuvant, or carrier.

23. (Currently Amended) Functionalized polymer as claimed in ~~any of claims 1 to 3~~ claim 1, wherein o is from 2 to 20.
24. (Currently Amended) Functionalized polymer as claimed in ~~any of claims 1 to 3~~ claim 1, wherein the group $-\text{[(CR}^1\text{R}^2)_m\text{O]}_n\text{[CR}^3\text{R}^4]_o-$ is ~~$-\text{CH}_2\text{CH}_2(\text{CH}_3)\text{CH}_2\text{CH}_2-$~~
 $-\text{CH}_2\text{CH}_2\text{CH}(\text{CH}_3)\text{CH}_2\text{CH}_2-$.
25. (Currently Amended) Conjugate as claimed in ~~any of claims 5 to 8~~ claim 5, wherein o is from 2 to 20.
26. (Currently Amended) Conjugate as claimed in ~~any of claims 5 to 8~~ claim 5, wherein the group $-\text{[(CR}^1\text{R}^2)_m\text{O]}_n\text{[CR}^3\text{R}^4]_o-$ is ~~$-\text{CH}_2\text{CH}_2(\text{CH}_3)\text{CH}_2\text{CH}_2-$~~ $-\text{CH}_2\text{CH}_2\text{CH}(\text{CH}_3)\text{CH}_2\text{CH}_2-$.
27. (Currently Amended) The process as claimed in ~~any of claims 10 to 12~~ claim 10, wherein o is from 2 to 20.
28. (Currently Amended) The process as claimed in ~~any of claims 10 to 12~~ claim 10, wherein the group $-\text{[(CR}^1\text{R}^2)_m\text{O]}_n\text{[CR}^3\text{R}^4]_o-$ is ~~$-\text{CH}_2\text{CH}_2(\text{CH}_3)\text{CH}_2\text{CH}_2-$~~
 $-\text{CH}_2\text{CH}_2\text{CH}(\text{CH}_3)\text{CH}_2\text{CH}_2-$.
29. (Canceled)
30. (Currently Amended) The process as claimed in claim 15 ~~or 17~~, wherein a functionalized polymer as claimed in ~~any of claims 23, 24 or 29~~ claim 23 is reacted with the functionalized protein of formula V.
31. (Original) The process as claimed in claim 18, wherein o is from 2 to 20.
- 32-35. (Canceled)